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EXAMINER

NOTE, JANIS L

ART UNIT PAPER NUMBER

1756

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/656,280

Applicant(s)

NIIMI ET AL.

Examiner

Janis L. Dote

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 19 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/8/03; 11/29/04; 12/14/04; 2/22/05; 10/4/05;
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. Applicants' election without traverse of the invention of Group I, claims 1-18, in the reply filed on Nov. 14, 2005, is acknowledged.

2. Claims 19 and 20 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on Nov. 14, 2005.

3. The examiner has considered only the US applications listed on "List of related cases" in the Information Disclosure statements filed on Nov. 29, 2004, Dec. 14, 2004, Feb. 22, 2005, Oct. 4, 2005, and Jan. 31, 2006.

The US applications listed in the "List of related cases" in the Information disclosure statement (IDS) filed on Dec. 8, 2003, have been crossed out by the examiner because the IDS does not comply with 37 CFR 1.98(a)(2)(iii), which requires legible copies of those portions of the copending US applications which caused them to be listed in the "List of Related Cases."

Since the submission appears to be bona fide, applicants are given ONE (1) MONTH from the date of this notice to supply the above mentioned omissions or corrections in the information

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disclosure statement. The examiner notes that if applicants have postcard receipts stating that the USPTO did receive copies of the documents, applicants should also provide a copy of the receipts so that there is no ambiguity in the record that applicants did provide copies of the missing documents.

NO EXTENSION OF THIS TIME LIMIT MAY BE GRANTED UNDER EITHER 37 CFR 1.136(a) OR (b). Failure to timely comply with this notice will result in the above mentioned information disclosure statement being placed in the application file with the noncomplying information not being considered. See 37 CFR 1.97(i).

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

In Fig. 1, the reference character **50**.

In Fig. 3, the reference character **19**.

In Fig. 13, the reference character **106**.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as

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either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

In Fig. 1, the reference sign **59**, which is identified in the instant specification at page 19, lines 18-19, as a "transfer charger."

In Fig. 3, the reference sign **30**, which is identified in the specification at page 28, lines 28-29, as a "developing unit."

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The examiner notes that the instant specification at page 20, lines 13-18, defines the term "proximal charging system charging member" recited in instant claim 12 as "a charging

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member which is not brought into contact with but proximal to the surface of the photoconductor so as to have a gap of 200 μm or less between the surface of a photoconductor and the surface of the charging member."

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 17 are indefinite in the phrases "a surface of the electrophotographic photoconductor exposed by the light irradiator requires 200 msec or less to reach the developer" and "exposure energy when the write light having resolution of 600 dpi or greater is irradiated from the light irradiator to the electrophotographic photoconductor is 5 erg/cm^2 or less on the surface thereof" because the claims appear to be covering both an apparatus and a method of use of that apparatus in a single claim. The combination of two separate statutory classes

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of invention in a single claim renders the claims indefinite because it is not clear whether applicants are claiming an apparatus or a process of use of that apparatus. See MPEP 2173.05(p)II (Rev. 3, Aug. 2005).

Claims 1 and 17 are indefinite in the phrase "exposure energy when the write light . . ." (emphasis added) for lack of unambiguous antecedent basis in said claims. Claims 1 and 17 previously recite "a light irradiator for irradiating a white light" (emphasis added), not a "write light" as later recited in the instant claims. It is not clear whether the light irradiator irradiates a white light or a write light.

Claim 6 is further indefinite in the phrase "contains one of an inorganic pigment and a metal oxide having a specific resistance . . ." (emphasis added) because it is not clear whether claim 6 requires the presence of both the inorganic pigment and the metal oxide or only one. In colloquial informal English, the phrase "one of A . . . and Z" can be read as being met by any one of A . . . and Z. More formally, if only one element is required, one might write "one of A . . . or Z." Or if all elements were required, one might write "one each of A . . . and Z." Clarification, supported by specific disclosure in the originally filed specification, is required.

Claim 8 is further indefinite in the phrase "at least one

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solvent selected from the cyclic ethers and aromatic hydrocarbons" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . ." or "R is . . . or . . ." MPEP 2173.05(h). Applicants are using a combination of both phrases. Thus, it is not clear what is the scope of the instant claim.

Claim 10 is further indefinite in the phrase "wherein a plurality of image forming elements each having at least a charger, a light irradiator, a developer, a transfer and an electrophotographic photoconductor have been arranged" for lack of antecedent basis in claim 1, from which claim 10 depends. Claim 1 does not recite that the apparatus comprises any image forming elements. The phrase is further indefinite because it is also is not clear in what way or for what purpose the plurality of image forming elements have been arranged.

Claim 13 is further indefinite because it does not further limit claim 12, from which claim 13 depends. As noted in paragraph 6 above, the instant specification defines a non-contact proximal charging system as a system having the property recited in instant claim 13.

Claim 15 is further indefinite in the phrase "apparatus may have, installed thereon, a freely detachable process cartridge in which an electrophotographic photoconductor has been formed

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integral" (emphasis added) because it is not clear whether the claim requires the presence of the process cartridge or whether it is merely an optional opponent.

Claim 14 is further indefinite in the phrase "alternating superimposed voltage is applied to the charger" because the claim appears to be covering two statutory classes of invention in a single claim. It is not clear whether applicants are claiming an apparatus or a process of use of that apparatus.

Claims 15 and 17 are indefinite in the phrase "process cartridge . . . with a least one unit selected from a charger, light irradiator, developer and charger" (emphasis added) for improper Markush language. Proper Markush language is "R is selected from the group consisting of . . . and . . ." or "R is . . . or . . ." MPEP 2173.05(h). Applicants are using a combination of both phrases. Thus, it is not clear what are the scopes of the instant claims.

Claims 16 and 18 are further indefinite in the phrase "the write light is irradiated from the light irradiator at a resolution of 600 dpi or greater" because the claim appears to be covering two statutory classes of invention in a single claim. It is not clear whether applicants are claiming an apparatus or a process of use of that apparatus.

Claims 16 and 18 are also indefinite in the phrase "the

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write light is irradiated . . . "(emphasis added) for lack of unambiguous antecedent basis in said claims. Claims 1 and 17, from which claims 16 and 18 depend, respectively, recite "a light irradiator for irradiating a white light" (emphasis added), not a "write light" as recited in instant claims 16 and 18. It is not clear whether the light irradiator irradiates a white light or a write light.

9. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

(Emphasis added.)

10. Claims 1-18 are rejected under 35 U.S.C. 101 because the claims are directed to nonstatutory subject matter. The claims are directed to neither a "process" nor an "apparatus." Rather, the claims are directed to both an apparatus and a process of using the apparatus, which are two different statutory classes of invention set forth in 35 U.S.C. 101. The statute, however, sets forth the statutory classes of invention in the alternative only.

11. Claims 1-18 are further rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory

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subject matter. The limitation an "exposure energy . . . is 5 erg/cm² or less on the surface . . . " is merely a form of energy, a transitory phenomenon that cannot form part of an apparatus.

12. In the interest of compact prosecution, the examiner has interpreted the claim language in instant claims 1 and 17 as directed to an apparatus, not a method of use.

The examiner has interpreted the claim language in instant claims 1 and 17 as reciting a "light irradiator for irradiating a write light", not a "white light."

The examiner has interpreted the claim language in claim 6 as reciting that the protective layer comprises either an inorganic pigment or a metal oxide. Antecedent basis for the examiner's interpretation can be found in the examples in the instant specification, e.g., page 100, lines 5-15.

The examiner has interpreted the claim language in claim 10 as requiring that the apparatus comprises a "plurality of image forming elements."

The examiner has interpreted the claim language in claim 15 as reciting that the process cartridge is an optional component.

Rejections based on these interpretations are set forth infra.

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13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered

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therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a).

16. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,430,526 (Ohkubo) combined with US 2002/0076633 A1 (Niimi'633).

Ohkubo discloses a process cartridge that comprises all the components recited in instant claims 17 and 18, but for the particular photosensitive member. Fig. 2 and col. 3, line 65, to col. 4, line 8. The process cartridge shown in Fig. 2 comprises the photosensitive drum 3, a charging roller 4, a developing device 5, and cleaning unit 8. Ohkubo teaches that the process cartridge is attachably or detachably mounted as a unit relative to an electrophotographic image forming apparatus. Col. 3, lines 63-65.

As discussed above, Ohkubo does not disclose the use of the photosensitive member recited in the instant claims. However, Ohkubo does not limit the type of photosensitive member used. See reference claims 9 and 10.

Niimi'633 discloses an electrophotographic photoconductive drum comprising a conductive support, a charge generation layer,

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and a charge transport layer disposed on the charge generation layer. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24° , no peaks between 7.4° and 9.3° , and no peak at 26.3° . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine with an X-ray of Cu-K α having a wavelength of "1.541 Å." Paragraph 0151; Fig. 6; and example 28 at pages 32-33. The location of the peaks at angles 7.3° , 9.4° , 9.6° , and 24° were determined by measuring the positions of the peaks with a ruler and interpolating the positions with the x-axis scale in Fig. 6. The titanyl phthalocyanine meets the phthalocyanine limitations recited in instant claim 17. According to Niimi'633, its photoconductive drum has good mechanical durability and electrostatic durability, and is capable of providing "high quality images even in repeated use." Paragraph 0045.

It would have been obvious for a person having ordinary skill in the art to use the photosensitive drum disclosed by Niimi'633 as the photosensitive drum in the process cartridge disclosed by Ohkubo. That person would have had a reasonable expectation of successfully obtaining an electrophotographic

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process cartridge that has good mechanical durability and electrostatic durability, and that is capable of providing "high quality images even in repeated use."

The claim language, "used as a detachable member and formed integral with an electrophotographic apparatus . . . ," recited in instant claims 17 and 18 is a statement of intended use that does not distinguish the process cartridge rendered obvious over the cited prior art. A recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. As discussed above, the process cartridge rendered obvious over the combined teachings of Ohkubo and Niimi'633 meets the process cartridge structural components recited in the instant claims. Thus, the intended use recited in the instant claims does not result in a structural difference between the process cartridge recited in the instant claims and the process cartridge rendered obvious over the cited prior art.

17. Claims 17 and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by US 2004/0033428 A1 (Niimi'428).

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Niimi'428 discloses an electrophotographic photoconductive drum comprising a conductive support, a charge generation layer, and a charge transport layer disposed on the charge generation layer. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24.0° , no peaks between 7.4° and 9.3° , and no peak at 26.3° . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine with an X-ray of Cu-K α having a wavelength of "1.542 Å." Paragraphs 0062-0064; Fig. 9; example 1 at page 14 and in Table 1 at page 15; and example 8 at pages 17-18. The titanyl phthalocyanine meets the phthalocyanine limitations recited in instant claim 17. Niimi'428 further teaches that its photoconductive drum can be used as the photoconductive member of a process cartridge where the cartridge further comprises a charger, a developer, an image transfer device, a cleaner, or a discharger. Paragraph 0158 and reference claim 19. The process cartridge disclosed by Niimi'428 meets the process cartridge structural elements recited in instant claims 17 and 18.

The claim language "used as a detachable member and formed integral with an electrophotographic apparatus . . . " recited in instant claims 17 and 18 is a statement of intended use that

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does not distinguish the process cartridge disclosed by the cited prior art. As discussed above, the process cartridge disclosed by Niimi'428 meets the process cartridge structural components recited in the instant claims. Thus, the intended use recited in the instant claims does not result in a structural difference between the process cartridge recited in the instant claims and the process cartridge disclosed by the cited prior art.

18. Claims 1, 2, 5, 7, 8, 10, 11, and 15-18 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,853,823 (Sugino).

Sugino discloses an image forming apparatus and a process cartridge that meet the apparatus and the process cartridge limitations recited in the instant claims. The image forming apparatus comprises a photoreceptor **1**, a charger **3**, a light irradiator **5**, an image developer **6**, and a transfer device **10, 11**. Fig. 3, and col. 10, line 53, to col. 11, line 15. Sugino further teaches an image forming apparatus comprising a plurality of image forming units, each comprising a photoreceptor **101**, a charger, a light irradiator, an image developer, and a transfer device **102**. Fig. 5 and col. 12, lines 34-43. Sugino also teaches a process cartridge that comprises a photoreceptor with a charger, an image irradiator or

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an image developer. See reference claim 9. Sugino teaches that the charger can be a charging roller, which meets the charger limitation recited in instant claim 11. Col. 10, lines 60-61. Sugino teaches that the light irradiator can emit a write light having a resolution of 600 dpi, 1,200 dpi, or 2,400 dpi. Col. 17, lines 25-27; and col. 19, lines 24-26. The photoreceptor comprises a conductive support, a charge generation layer, a charge transport layer disposed on the charge generation layer, and a protective layer. Example 1 at cols. 16-17. The charge transport layer is formed using tetrahydrofuran, a non-halogen solvent, which meets the solvent limitations recited in instant claims 7 and 8. The protective layer comprises alumina fine particles, which meet the protective layer limitations recited in instant claim 5. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24° , no peaks between 7.4° and 9.3° , and no peak at 26.3° . Fig. 7; and example 28 at pages 32-33. The location of the peaks at angles 7.3° , 9.4° , 9.6° , and 24° were determined by measuring the positions of the peaks with a ruler and interpolating the positions with the x-axis scale in Fig. 7.

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The X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 2, and 17.

Sugino does not disclose that the X-ray diffraction was obtained with the Cu-K α wavelength of 1.542 Å. However, as discussed above, the Sugino X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 2, and 17. Accordingly, it is reasonable to presume that the X-ray diffraction pattern disclosed in Sugino is determined with Cu-K α having the Cu-K α wavelength of 1.542 Å as recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Sugino does not disclose that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claims 1 and 17. Nor does Sugino disclose that the apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm² or less on the surface thereof" as recited in instant claims 1 and 17. However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required are merely functional language describing how the apparatus functions. For the reasons discussed supra, the apparatus and the process

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cartridge disclosed by Sugino meet all of the structural limitations recited in the instant claims. The recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatus and process cartridge disclosed by the cited prior art. "Claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function." MPEP 2114 and cases cited therein. "A claim containing a 'recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus' if the prior art apparatus teaches all the structural limitations of the claim." MPEP 2114, citing Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

19. US 2003/0104295 (Niimi'295) has a filing date of Mar. 22, 2002, and was published on Jun. 5, 2003, which are both prior to the filing date of the instant application. Thus, Niimi'295 qualifies as art under 35 U.S.C. 102(a), as well as, under 35 U.S.C. 102(e). Accordingly, Niimi'295 also qualifies as prior art under 35 U.S.C. 103(c).

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20. Claims 1, 2, and 4-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'295 combined with US 2001/0022343 (Sakai).

Niimi'295 discloses an image forming apparatus and a process cartridge. The image forming apparatus comprises a photoreceptor **6**, a charger **8**, a light irradiator **10**, an image developer **11**, and a transfer device **15**. Fig. 5 and paragraphs 0115 to 0116 and 0122. Niimi'295 further teaches an image forming apparatus comprising a plurality of image forming units, each comprising a photoreceptor, a charger, a light irradiator, an image developer, and a transfer device. Fig. 10 and paragraphs 0127-0128. Niimi'295 also teaches a process cartridge that comprises a photoreceptor with a charger, an image irradiator, or an image developer. Fig. 7 and paragraph 0126. Niimi'295 teaches that the charger can be a contact charging system, such as a contact charging roller, as recited in instant claim 11, or a non-contact proximal charging system as recited in instant claims 12 and 13.

Paragraphs 0117-0118. Niimi'295 also teaches that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Paragraph 0119.

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Niimi'295 exemplifies a photoreceptor comprising a conductive support, a charge generation layer, a charge transport layer disposed on the charge generation layer, and three protective layers. See example 14 at pages 24-26. All three protective layers comprise α -alumina fine particles having a resistivity of $2.5 \times 10^{12} \Omega \cdot \text{cm}$, which meets the protective layer limitations recited in instant claims 5 and 6. Niimi'295 further discloses that the three protective layers can comprise a charge transferring polycarbonate having a side-chain comprising a triarylamine structure; and are formed using non-halogen solvents such as tetrahydrofuran and cyclohexanone. See example 7 at pages 21-22. Because the first and second protective layers comprise the charge transferring polycarbonate, the layers are charge transport layers and therefore meet the charge transport layer limitations recited in instant claims 4, 7, and 8. Niim'295 also teaches that the conductive support can be anodized surface as recited in instant claim 9. Paragraphs 0047-0048. The charge generation layer comprises titanyl phthalocyanine crystals dispersed in a binder resin. The titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24° , no peaks between 7.4° and 9.3° , and no peak at 26.3° . See Fig. 8.

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The location of the peaks at angles 7.3°, 9.4°, 9.6°, 24°, and 27.2° were determined by measuring the positions of the peaks with a ruler and interpolating the positions with the x-axis scale in Fig. 8. The X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 2, and 17.

Niimi'295 does not disclose that the X-ray diffraction was obtained with the Cu-K α wavelength of 1.542 Å. However, as discussed above, the Niimi'295 X-ray diffraction pattern meets the peak location limitations recited in instant claims 1, 2, and 17. Accordingly, it is reasonable to presume that the X-ray diffraction pattern disclosed in Niimi'295 is determined with Cu-K α having a wavelength of 1.542 Å as recited in the instant claims. The burden is on applicants to prove otherwise.

Fitzgerald, supra.

Niimi'295 does not disclose that its light irradiator provides a write light having a resolution of 600 dpi or greater as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. Fig. 6, paragraph 0131. The writing density of the multi-beam scanning device is 1200 dpi

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and the laser beam has a beam spot diameter of 30 μm .

Paragraph 0137. The writing density of 1200 dpi meets the resolution limitations recited in instant claims 1 and 16-18.

According to Sakai, the multi-beam scanning device "effectively reduces the variations of the beam spots on the scanned surface to a smallest possible level so that the multi-beam scanning is carried out with accurate beam spot diameter so as to create good quality reproduced image." Sakai discloses that in conventional multi-beam scanning devices, the divergence angle of the laser beams emitted by the semiconductor laser array is liable to variations that cause the degradation of the quality of a reproduced image. Paragraph 0009.

It would have been obvious for a person having ordinary skill in the art to use the Sakai multi-beam scanning device as the light irradiator in the apparatus or the process cartridge disclosed by Niimi'295. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus and a process cartridge that provide good quality reproduced images having a resolution of 1200 dpi.

The cited prior art does not disclose that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claims 1 and 17. Nor does the cited prior art disclose that the

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apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm² or less on the surface thereof" as recited in instant claims 1 and 17.

However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required are merely functional language describing how the apparatus functions. For the reasons discussed supra, the apparatus and process cartridge rendered obvious over the combined teachings of the prior art meet all of the structural limitations recited in the instant claims. The recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatus and process cartridge rendered obvious over the cited prior art.

21. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'295 combined with Sakai as applied to claim 1 above, further combined with Japanese Patent 11-140337 (JP'337), as evidenced by Ladd et al., Structure Determination by X-ray Diffraction, p. 426. See the USPTO English-language translation of JP'337 for cites.

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Niimi'295 combined with Sakai renders obvious an image forming apparatus as described in paragraph 20 above, which is incorporated herein by reference.

Niimi'295 does not exemplify the use of titanyl phthalocyanine crystals having an average particle diameter as recited in the instant claim. However, as discussed in paragraph 20 above, the Niimi'295 charge generation layer comprises titanyl phthalocyanine crystals dispersed in a binder resin, where the titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of 27.2° .

JP'337 teaches a dispersion comprising a titanyl phthalocyanine crystal that exhibits an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° and a particular polyvinyl acetyl binder resin. The diffraction pattern is obtained by irradiating the titanyl phthalocyanine with a Cu-K α X-ray having a wavelength of "1.514 Å." Translation, paragraph 0007 and 0050-0051; and dispersion 2 in paragraph 0053 and in Table 1 at page 39. According to JP'337, when the dispersion of titanyl phthalocyanine is used to form a charge generation layer in a photoreceptor, the resulting photoreceptor has high sensitivity even after repeated use. The chargeability of the photoreceptor

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does not decrease and the residual potential does not increase after repeated use. Translation, paragraph 0006.

The JP'337 reported wavelength of 1.514 Å appears to be a typographic error. The Cu-Kα wavelength of 1.514 Å does not appear to exist. It is well known that the Cu-Kα spectra line is a doublet consisting of α1 ($\lambda = 1.5405$) and α2 ($\lambda = 1.5443$). The weighted mean Kα line is 1.542 Å, which is the value normally used in Cu-Kα X-ray diffraction. See Ladd, p. 426. Accordingly, because JP'337 teaches using the X-ray of Cu-Kα and because Cu-Kα is known in the art to have mean wavelength of 1.542 Å, it is reasonable to presume that the X-ray diffraction pattern disclosed in JP'337 is determined with Cu-Kα having a wavelength of 1.542 Å, as recited in the instant claims. The burden is on applicants to prove otherwise. Fitzgerald, supra.

JP'337 does not explicitly disclose that the titanyl phthalocyanine crystal has an average particle diameter of not greater than 0.3 μm as recited in instant claim 3. However, JP'337 discloses that the titanyl phthalocyanine is milled with a particular polyvinyl acetal and a solvent. The resultant dispersion comprises particles having a mean grain diameter of 0.28 μm. See the translation, Table 1 at page 39, dispersion 2. The dispersion particle size of 0.28 μm is within the range of not greater than 0.3 μm recited in instant claim 3. Thus, it is

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reasonable to conclude that the titanyl phthalocyanine crystal has an average particle diameter of not greater than 0.3 μm as recited in instant claim 2. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'337, to form a dispersion comprising the Niimi'295 titanyl phthalocyanine crystals and the JP'337 particular polyvinyl acetal binder resin as taught by JP'337, such that the resultant dispersion has a mean grain diameter of 0.28 μm , and to use the resultant dispersion to form the charge generation layer in the photoreceptor disclosed by Niimi'295. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has improved photosensitivity and that has stable charging properties and residual potential properties after repeated use.

22. Claims 1, 2, 5, 6-8, 10, 11, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633 combined with Sakai.

Niimi'633 discloses an image forming apparatus that comprises a photoreceptor **1**, a charger **8**, a light irradiator **10**, an image developer **11**, and a transfer device **15a**, **15b**. Fig. 3

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paragraphs 0061 and 0300-0305. Niimi'633 further teaches an image forming apparatus comprising a plurality of image forming units, each comprising a photoreceptor, a charger, a light irradiator, an image developer, and a transfer device. Fig. 7 and paragraphs 0320-0324. Niimi'633 teaches that the charger can be a contact charging system, such as a contact charging roller, as recited in instant claim 11. Paragraph 0302 and Fig. 3, reference label 8. Niimi'633 also teaches that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Paragraph 0302.

Niimi'633 exemplifies a photoreceptor comprising an aluminum conductive drum, a charge generation layer, a charge transport layer disposed on the charge generation layer, and a protective layer. See example 28 at pages 32-33. The protective layer comprises particulate alumina having a specific resistivity of $2.5 \times 10^{12} \Omega \cdot \text{cm}$, which meets the protective layer limitations recited in instant claims 5 and 6. The charge generation layer comprises titanyl phthalocyanine crystals dispersed in a binder resin. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° ,

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and 24°, no peaks between 7.4° and 9.3°, and no peak at 26.3°.

The discussion of the Niimi'633 charge generation layer in paragraph 16 above is incorporated herein by reference. The X-ray diffraction pattern meets the peak location limitations recited in instant claims 1 and 2. Niimi'633 further teaches that the charge transport layer can be formed from a non-halogen solvent, such as tetrahydrofuran or dioxane, which meets the solvent limitations recited in instant claims 7 and 8.

Paragraph 0173 and example 1 in paragraphs 0364-0367.

Niimi'633 does not disclose that its light irradiator provides a write light having a resolution of 600 dpi or greater as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. The scanning device provides a writing density of 1200 dpi and the laser beam has a beam spot diameter of 30 μm . The discussion of Sakai in paragraph 20 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art to use the Sakai multi-beam scanning device as the light irradiator in the apparatus disclosed by Niimi'633.

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That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides good quality reproduced images having a resolution of 1200 dpi.

The cited prior art does not disclose that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claims 1 and 17. Nor does the cited prior art disclose that the apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm² or less on the surface thereof" as recited in instant claim 1. However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required are merely functional language describing how the apparatus functions. For the reasons discussed supra, the apparatus and process cartridge rendered obvious over the combined teachings of the prior art meet all of the structural limitations recited in the instant claims. The recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatus and process cartridge rendered obvious over the cited prior art.

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23. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633 combined with Sakai, as applied to claim 1 above, further combined with JP'337, as evidenced by Ladd et al., Structure Determination by X-ray Diffraction, p. 426. See the USPTO English-language translation of JP'337 for cites.

Niimi'633 combined with Sakai renders obvious an image forming apparatus as described in paragraph 22 above, which is incorporated herein by reference.

Niimi'633 does not exemplify the use of titanyl phthalocyanine crystals having an average particle diameter as recited in the instant claim. However, as discussed in paragraph 22 above, the Niimi'633 charge generation layer comprises titanyl phthalocyanine crystals dispersed in a binder resin, where the titanyl phthalocyanine crystals exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle of 27.2°.

JP'337 teaches a dispersion comprising a titanyl phthalocyanine crystal that exhibits an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° and a particular polyvinyl acetyl binder resin. The discussions of JP'337 and Ladd in paragraph 21 above are incorporated herein by reference.

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It would have been obvious for a person having ordinary skill in the art, in view of the teachings of JP'337, to form a dispersion comprising the Niimi'633 titanyl phthalocyanine crystals and the JP'337 particular polyvinyl acetal binder resin as taught by JP'337, such that the resultant dispersion has a mean grain diameter of 0.28 μm , and to use the resultant dispersion to form the charge generation layer in the photoreceptor in the image forming apparatus rendered obvious over the combined teachings of Niimi'633 and Sakai. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has improved photosensitivity and that has stable charging properties and residual potential properties after repeated use.

24. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633 combined with Sakai, as applied to claim 1 above, further combined with US 2002/0051654 (Niimi'654).

Niimi'633 combined with Sakai renders obvious an image forming apparatus as described in paragraph 22 above, which is incorporated herein by reference.

Niimi'654 teaches that polycarbonates comprising triarylamine structures in the main and/or side-chain of the

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polymer can be used as charge transport materials in charge transport layers. Paragraph 0186-0200. According to Niimi'654, charge transport layers that comprise said polycarbonates have good abrasion resistance. Paragraph 0186.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Niimi'654, to use the polycarbonate charge transporting material disclosed by Niimi'654 as the charge transport material in the charge transport layer in the photoreceptor in the image forming apparatus rendered obvious over the combined teachings of Niimi'633 and Sakai. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has improved resistant to abrasion, and thus improved mechanical stability after repeated use.

25. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633 combined with Sakai, as applied to claim 1 above, further combined with US 6,120,955 (Tokutake).

Niimi'633 combined with Sakai renders obvious an image forming apparatus as described in paragraph 22 above, which is incorporated herein by reference.

Niimi'633 does not exemplify the use of an electroconductive drum having an anodized surface as recited in

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instant claim 9. However, Niimi'633 does not limit type of conductive aluminum substrate used. Paragraph 0143, lines 5 and 10-15.

Tokutake teaches a conductive aluminum drum that has a particular sealed anodized layer formed on the surface of said drum. According to Tokutake, when an electrophotographic photosensitive member, i.e., a photoreceptor, comprises said conductive aluminum drum as the conductive substrate, there is no formation of imaging noise, such as black spots or white spots under any environmental condition. Col. 2, lines 16-26, and example 1 at col. 9, lines 37-64.

It would have been obvious for a person having ordinary skill in the art to use the Tokutake electrically conductive aluminum drum comprising the particular sealed anodized layer as the conductive drum in the photoreceptor in the image forming apparatus rendered obvious over the combined teachings of Niimi'633 and Sakai. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides images without the occurrence of black spots and white spots under any environment condition.

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26. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niimi'633 combined with Sakai, as applied to claim 1 above, further combined with Niimi'654.

Niimi'633 combined with Sakai renders obvious an image forming apparatus as described in paragraph 22 above, which is incorporated herein by reference.

Niimi'633 does not exemplify the use of a charger as recited in instant claims 12 and 13. However, Niimi'633 does not limit the type of charger used. Niimi'633 teaches that "[k]nown charging devices, such as . . . charging rollers can be used." Paragraph 0302.

Niimi'654 discloses a proximity charger comprising a charging roller **81**, wherein the gap formed between the charger roller **81** and the photoreceptor **1** is preferably from 10 to 200 μm , which meets the charger limitations recited in instant claims 12 and 13. Fig. 3, and paragraphs 0030, 0034, and 0089. According to the Niimi'654, its charger is inexpensive. The charger does not cause toner film formation on the surface of the charger even when charger is repeatedly used. Paragraph 0029. The charger does not cause the uneven charging characteristic of proximity charging even when used for a long period of time, which results in "the formation of good images for a long period of time." Niimi'654 discloses that an image

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forming apparatus comprising said charger stably provides good quality images even when repeatedly used without frequently changing the photoreceptor. Paragraphs 0030-0031.

It would have been obvious for a person having ordinary skill in the art to use for proximity charger disclosed by Niimi'654 as the charger in the image forming apparatus rendered obvious over the combined teachings of Niimi'633 and Sakai. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that has benefits disclosed by Niimi'654.

27. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an

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invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

28. Claims 1-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-37 of copending Application No. 10/665,155 (Application'155) in view of Sakai.

This is a provisional obviousness-type double patenting rejection.

Reference claim 4, which depends on reference claim 1 of Application'155, recites an image forming apparatus comprising at least one image forming unit that comprises a photoreceptor, a charger, a light irradiator, an image developer, and a transferer. The photoreceptor comprises an electroconductive substrate comprising a charge generation layer and a charge transport layer disposed over the charge generation layer. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24.0° , no peaks greater than 7.3° and less than 9.4° , and no peak at 26.3° . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine

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crystals with a Cu-K α X-ray having a wavelength of 1.542 Å.

The titanyl phthalocyanine crystals meet the titanyl phthalocyanine crystals recited in instant claims 1 and 2.

Reference claim 5, which depends from reference claim 1, requires that the titanyl phthalocyanine crystals have an average particle diameter of less than 0.3 μm , which meets the particle diameter limitation recited in instant claim 3.

Reference claims 8, 14, and 15, which depend from reference claim 1, recite a charge transport layer that meets the charge transport layer limitations recited in instant claims 4, 7, and 8, respectively. Reference claims 9 and 10, which depend from reference claim 1, recite that the photoreceptor further comprise a protective layer disposed on the charge transport layer that meets the protective layer limitations recited in instant claims 5 and 6, respectively. Reference claim 16, which depends from reference claim 1, requires that the conductive substrate have an anodized film as recited in instant claim 9. Reference claim 17, which depends from reference claim 1, requires that the apparatus comprise a plurality of image forming units, which meets the apparatus limitation recited in instant claim 10. Reference claims 18 and 19, which depend on reference claim 1, require that the charger be a contact charger or a non-contact charger, as recited in instant claim 11 and in

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instant claims 12 and 13, respectively. Reference claim 20, which depends on reference claim 1, requires that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14.

The claims in Application'155 do not recite that the light irradiator provides a write light having a resolution of 600 dpi or greater as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. The scanning device provides a writing density of 1200 dpi and the laser beam has a beam spot diameter of 30 μm . The discussion of Sakai in paragraph 20 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter recited in the claims of Application'155 and the teachings in Sakai, to use the Sakai multi-beam scanning device as the light irradiator in the apparatus claimed in Application'155. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus that provides good quality reproduced images having a resolution of 1200 dpi.

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Neither the claims of Application'155 nor Sakai recite that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claim 1. Nor do they recite that the apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm² or less on the surface thereof" as recited in instant claim 1. However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required merely describe how the apparatus functions. For the reasons discussed supra, the apparatus rendered obvious over the subject matter claimed in Application'155 combined with the teachings of Sakai meet all of the structural limitations recited in the instant claims. The functional recitations do not distinguish the structural elements in the instantly claimed apparatus from those in the apparatus rendered obvious over the subject matter claimed in Application'155 combined with the teachings of Sakai.

29. Claims 1-3, 5, 6 and 9-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as

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being unpatentable over claims 1, 2, and 5-19 of copending Application No. 0/454,556 (Application'556) in view of Sakai.

This is a provisional obviousness-type double patenting rejection.

Reference claim 14, which depends on reference claim 5, which in turn depends on reference claim 1 of Application'556, recites an image forming apparatus comprising at least one image forming unit that comprises a photoreceptor, a charger, a light irradiator, an image developer, and a transferer. The photoreceptor comprises an electroconductive substrate comprising a charge generation layer and a charge transport layer disposed over the charge generation layer. The charge generation layer comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24.0° , and no peaks between 7.3° and 9.4° . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine crystals with a Cu-K α X-ray having a wavelength of 1.542 Å. The titanyl phthalocyanine crystals have an average particle diameter of not greater than 0.2 μm . The titanyl phthalocyanine crystals meet the titanyl phthalocyanine crystals recited in instant claims 1, 3, and 17. Reference claim 2, which depends on reference claim 1, further requires that the

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titanyl phthalocyanine crystals exhibit no peak at 26.3°, which is the same as the peak limitation recited in instant claim 2. Reference claims 7 and 8, which depend from reference claim 5, require that the photoreceptor further comprise a protective layer disposed on the charge transport layer that meets the protective layer limitations recited in instant claims 5 and 6, respectively. Reference claim 12, which depends from reference claim 5, requires that the conductive substrate have an anodized film as recited in instant claim 9. Reference claim 15, which depends from reference claim 14, requires that the apparatus comprises a plurality of image forming units, which meets the apparatus limitation recited in instant claim 10. Reference claims 16 and 17, which depend on reference claim 14, require that the charger be a contact charger or a non-contact charger as recited in instant claim 11 and in instant claims 12 and 13, respectively. Reference claim 18, which depends on reference claim 14, requires that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Reference claim 19, which also depends from reference claim 5, recites a process cartridge comprising said photoreceptor and at least one of a charger, a light irradiator, an image developer, and a transferer.

The claims in Application'556 do not recite that the light

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irradiator provides a write light having a resolution of 600 dpi or greater as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. The scanning device provides a writing density of 1200 dpi and the laser beam has a beam spot diameter of 30 μm . The discussion of Sakai in paragraph 20 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter recited in the claims of Application'556 and the teachings in Sakai, to use the Sakai multi-beam scanning device as the light irradiator in the apparatus and process cartridge claimed in Application'556. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus and a process cartridge that provide good quality reproduced images having a resolution of 1200 dpi.

Neither the claims of Application'556 nor Sakai recite that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claims 1 and 17. Nor do they recite that the

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apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm² or less on the surface thereof" as recited in instant claims 1 and 17.

However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required merely describe how the apparatus functions.

For the reasons discussed supra, the apparatus and process cartridge rendered obvious over the subject matter claimed in Application'556 combined with the teachings of Sakai meet all of the structural limitations recited in the instant claims. The functional recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatus and process cartridge rendered obvious over the subject matter claimed in Application'556 combined with the teachings of Sakai.

30. Claims 1-3, 5, 6, and 10-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 and 29-35 of copending Application No. 10/944,614 (Application'614) in view of Sakai.

This is a provisional obviousness-type double patenting rejection.

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Reference claim 29, which depends on reference claim 1 of Application'614, recites an image forming apparatus comprising at least one image forming unit that comprises a photoreceptor, a charger, a light irradiator, an image developer, and a transfer device. The photoreceptor comprises an electroconductive substrate comprising a photosensitive layer that comprises titanyl phthalocyanine crystals that exhibit an X-ray diffraction pattern having a maximum peak at a Bragg angle ($2\theta \pm 0.2^\circ$) of 27.2° , a lowest peak at 7.3° , peaks at 9.4° , 9.6° , and 24.0° , no peaks between 7.3° and 9.4° , and no peak at 26.3° . The diffraction pattern is obtained by irradiating the titanyl phthalocyanine crystals with a Cu-K α X-ray having a wavelength of 1.542 Å. The titanyl phthalocyanine crystals have an average particle diameter of less than or equal to 0.25 μm . The titanyl phthalocyanine crystals meet the titanyl phthalocyanine crystals recited in instant claims 1-3. Reference claim 2, which depends from reference claim 1, requires that photosensitive layer comprises a charge generation layer comprising the titanyl phthalocyanine crystals and a charge transport layer disposed over the charge generation layer, which meets the layer structure recited in instant claim 1. Reference claims 18-20, which depend from reference claim 1, recite that the photoreceptor further comprises a protective layer disposed

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on the charge transport layer that meets the protective layer limitations recited in instant claims 5 and 6. Reference claim 30, which depends from reference claim 29, requires that the apparatus comprise a plurality of image forming units, which meets the apparatus limitation recited in instant claim 10. Reference claims 31 and 32, which depend on reference claim 1, require that the charger be a contact charger or a non-contact charger as recited in instant claim 11 and in instant claims 12 and 13, respectively. Reference claim 33, which depends on reference claim 1, requires that an alternating superimposed voltage can be applied to the charger, which meets the charger limitation recited in instant claim 14. Reference claim 35, which also depends from reference claim 1, recites a process cartridge comprising said photoreceptor and at least one of a charger, a light irradiator, and an image developer.

The claims in Application'614 do not recite that the light irradiator provides a write light having a resolution of 600 dpi or greater as recited in the instant claims.

Sakai discloses a multi-beam scanning device to imagewise irradiate the charged photoconductor to form a latent electrostatic latent image. The multi-beam scanning device comprises a semiconductor laser (or laser diode) array **112** and a rotary polygonal mirror **152**. The scanning device provides a

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writing density of 1200 dpi and the laser beam has a beam spot diameter of 30 μm . The discussion of Sakai in paragraph 20 above is incorporated herein by reference.

It would have been obvious for a person having ordinary skill in the art, in view of the subject matter recited in the claims of Application'614 and the teachings in Sakai, to use the Sakai multi-beam scanning device as the light irradiator in the apparatus and process cartridge claimed in Application'614. That person would have had a reasonable expectation of successfully obtaining an image forming apparatus and a process cartridge that provide good quality reproduced images having a resolution of 1200 dpi.

Neither the claims of Application'614 nor Sakai recite that the surface of the photoreceptor "exposed by the light irradiator requires 200 msec or less to reach the developer" as recited in instant claims 1 and 17. Nor do they recite that the apparatus comprises "an exposure energy when the write light having a resolution of 600 dpi or greater is irradiated from the light irradiator to . . . photoconductor is 5 erg/cm^2 or less on the surface thereof" as recited in instant claims 1 and 7. However, the recitations of how fast the photoreceptor moves from the light irradiator to the developer and of how much energy is required merely describe how the apparatus functions.

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For the reasons discussed supra, the apparatus and process cartridge rendered obvious over the subject matter claimed in Application'614 combined with the teachings of Sakai meet all of the structural limitations recited in the instant claims. The functional recitations do not distinguish the structural elements in the instantly claimed apparatus and process cartridge from those in the apparatus and process cartridge rendered obvious over the subject matter claimed in Application'614 combined with the teachings of Sakai.

31. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's acting supervisor, Mr. Nam Nguyen, can be reached on (571) 272-1342. The central fax phone number is (571) 273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Claudia Sullivan, whose telephone number is (571) 272-1052.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JLD

Mar. 2, 2006

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